Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at http://about.jstor.org/participate-jstor/individuals/early-journal-content.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

Journal of the Society of Arts.

◆

FRIDAY, NOVEMBER 9, 1866.

Announcements by the Council.

◆

Notice to Members.

The One-Hundred-and-Thirteenth Session of the Society will commence on Wednesday, the 21st instant, when the Opening Address will be delivered by Sir Thomas Phillips, Q.C., F.G.S., Chairman of the Council.

The following are the dates of the Wednesday evening meetings, the chair being taken at 8 o'clock :—

1866. November	—	—	21	28	
„ December	5	12	19	—	
1867. January	—	—	16	23	30
„ February	6	13	20	27	
„ March..........	6	13	20	27	
„ April	3	10	—	24	
„ May	1	8	15	22	29
„ June	—	—	—	26*	

For the Meetings previous to Christmas, the following arrangements have been made :—

November 21.—Opening Address by the Chairman of the Council.

November 28.—" On the Effect of Unlimited Liability Partnership on the Progress of Arts, Manufactures, and Commerce." By William Hawes, Esq., F.G.S.

December 5.—" On the Trade in Foreign Cattle." By John Irwin, Esq.

December 12.—" On Old London: its Streets and Thoroughfares." By J. G. Crace, Esq.

December 19.—" On the Study of Indian Architecture." By James Fergusson, Esq., F.R.S.

A book of blank Tickets of Admission to the Meetings has been forwarded to each Member, who is privileged to introduce two friends to each meeting on their presenting orders signed by him. Additional tickets will be forwarded on application.

The Cantor Lectures for the ensuing Session will consist of Three Courses, the particulars of which will be announced in the *Journal.*

Examinations, 1867.

The Programme of Examinations for 1867 is now published, and may be had *gratis* on application to the Secretary of the Society of Arts.

In addition to the prizes offered by the Society of Arts, the Worshipful Company of Coach and Coach Harness Makers offer a prize of £3 in Freehand Drawing, and a prize of £2 in Practical Mechanics, to the candidates who, *being employed in the coach-making trade,* obtain the highest number of marks, with a certificate, in those subjects respectively.

National Musical Education.

The following circular has been forwarded to each member of the Society :—

Society for the Encouragement of Arts, Manufactures,
and Commerce, Adelphi, London, W.C.,
October, 1866.

Sir,—I am directed by the Council to direct your particular attention to the two reports of the Musical Education Committee of this Society, appended hereto.* This Committee was formed early in the year 1865, and has ever since been actively engaged in promoting the object for which it was appointed. On reference to the reports, it will be seen that the Committee has collected the views and opinions of gentlemen who are among the chief authorities in the musical profession, whilst the names of those serving on the Committee show that many distinguished amateurs have been willing to cooperate with the Society. The Committee has also obtained valuable information relative to foreign musical academies; and has received much assistance in its inquiries from the Royal Academy of Music in this country. The proceedings of the Committee have, from time to time, been published in the *Journal,* for the information of the members of the Society.

The Royal Academy of Music has expressed its full concurrence in the views of the Committee, and its willingness to do all in its power to carry them out.

The Duke of Buckingham (as Lord President of the Council) has invited the Earl of Derby (as President of Her Majesty's Commissioners for the Exhibition of 1851), Earl Granville (as Chairman of the Finance Committee of that body), and the Earl of Wilton (as Chairman of the Royal Academy of Music), to consider an application made by the Academy for permanent premises.

The Council of the Society of Arts have resolved to establish, at the proper time, four such Scholarships as are recommended in the report.

The Council feel that the successful re-establishment of the Royal Academy of Music must depend upon the earnest and active support of the public, and they have resolved to call the attention of the friends of musical education to the subject, whether as individuals or public bodies, and to appeal to them for their co-operation. They have determined, in the first instance, to place the matter before each member of the Society, and to ask if he is disposed to exert his influence in promoting this important national work.

Should you be willing to assist the Council in this matter, I request you to favour me with a reply, in order that I may have the pleasure of entering your name on the list of those who desire to see this national object carried into effect with credit to the country.

I am, sir,
Your obedient servant,
P. Le Neve Foster, *Secretary.*

Proceedings of Institutions.

◆

City of London College.—On Tuesday evening, the 31st October, the prizes and certificates awarded by the Society of Arts and by the authorities of the College, were distributed at the College, in Leadenhall-street, by Sir Thomas Phillips, Q.C., F.G.S., chairman of the Council of the Society of Arts. There was a large attendance of the students, members, and friends of the college. The report, which was read by the hon. secretary, the Rev. J. Maskell, stated that, although not marked by any features of novelty, the year had been one of quiet and systematic work—of hopeful and steady progress. At the last examination of the Society of Arts, the City of London College, with its sixty-six candidates, gained no less than 17 prizes, and 33 first-class certificates. This college has also obtained the Prince Consort's prize of 25 guineas for this year, in the person of Mr. J. Rigby Smith. The average number of students for the three terms exceeded 800; but the number of vouchers taken to enable many of these students to attend several classes exceeded 1,000. The result of the examination conducted by the college board of examiners in the month of July was equally creditable. Although but 65 candidates presented themselves for examination, to these 34 first-class, 22 second-class, and 22 third-class certificates were awarded. Prizes were obtained as follows:—For arithmetic, by H. B. Brain; for bookkeeping, by W. Carter; for chemistry, by A. Liversidge; for divinity, by S. W. Casserley; for English history, by A. Sarll; for freehand drawing, by C. E. Pearce; for mechanical drawing, by W. R. Mallett; for German, by J. S. Harding; the annual scholarship of £10, with free admission to the college for one year, allotted to the student who obtained the highest aggregate number of marks in any three of the subjects of examination, H. B. Brain; the Greatorex prize of £5, for proficiency in modern languages, J. S. Harding; the Lowth prize of £3, allotted to the student who had attended the classes most regularly in three of the subjects for examination, provided he obtain two first-class certificates, and his conduct and character be unimpeachable, H. B. Brain; the English essay prize (subject—Strikes and Lockouts) of £2, W. D. Cramp; the Goethe German essay prizes of £3 and £2, founded by the professor of German, Dr. Zerffi, for the encouragement of the study of that language. 1st—F. B. Evans; 2nd—W. Holman; the Payne prize of £5, founded by Mr. D. Payne, a member of the council, for promoting the study of chemistry, natural theology, and human physiology, J. Hughes; the Thompson prize of £5, given by Messrs. W. J. and H. Thompson, for proficiency in arithmetic and bookkeeping, H. B. Brain. Of the general character of the work of the examination, most of the examiners gave a favourable report. The financial position of the college was highly satisfactory. The balance-sheet showed that, after the payment of the previous deficiencies, there was an actual surplus of £29 2s. 6d.; and, besides that sum, there was a balance to the credit of the establishment fund amounting to £228 17s. 9d. Sir Thomas Phillips then proceeded to distribute the various prizes, and at the conclusion of this ceremony he delivered an address. He said he attended tonight to present these prizes and certificates with the greatest possible pleasure. He knew something of the circumstances under which this college originated, and had attained its present important position. He considered this college, for the class of persons to whom it was especially devoted, to be the most important movement of our time. The City of London College, although not in name, but substantially in form, was one of the first institutions which was started to enable the young men of that great city to improve themselves by attending evening classes. It was gratifying to know that this institution had succeeded. Success did not always follow in life even the best efforts or the best-contrived designs, but it was impossible to look at the work done in this college during the past few years, it was impossible even to look at the rewards which had been conferred that evening without feeling that a very large amount of good was being diffused amongst the mass of this great city, and the most important results were being achieved. These evening classes afforded to all who chose to avail themselves of their advantages an important means of self-help, and facilities for ultimate advancement which otherwise might never come within their reach. But these classes had still higher claims and functions. By withdrawing the youth of a great city from temptations to which they were too freely exposed, and giving them habits of methodical study, they aided largely in the formation of character, and exercised a beneficial influence on society at large. He was also glad to know that the college had succeeded financially, because financial success was necessary in this life to secure the permanency of any labours. Sir Thomas Phillips concluded his address by a few appropriate words of advice to the young students whom he addressed. Mr. P. L. Simmonds then moved the following resolution:—"That this meeting, representing the friends and supporters of the City of London College, desires to tender its best thanks to the Society of Arts for the liberal encouragement received at their hands, as manifested by the prizes and certificates this day distributed." Mr. Knight seconded the resolution, which was carried unanimously, and duly acknowledged by Sir Thomas Phillips. Votes of thanks to the examiners and adjudicators for the services they had rendered, to the professors and educational staff of the college, and to the principal (the Rev. Mr. Whittington) were proposed and carried by acclamation. Mr. E. G. Clarke, in proposing the latter vote, drew attention to the fact that the examination held by the Society of Arts included 32 subjects, in nine of which the first places had been taken by pupils of the college. The proceedings closed with complimentary recognitions of the services rendered by Sir Thomas Phillips, who gave away the prizes, and the Rev. C. Mackenzie, who presided.

---

* **The Annual General Meeting: the chair will be taken at four o'clock. No visitors are admitted to this meeting.**

* See *Journal,* pp. 565 and 613.

Lancashire and Cheshire Union of Institutes.—Clitheroe Mechanics' Institution.—The annual meeting in connection with the above Institution was held on Monday, October 29th. The report stated that the success during the past year had never been surpassed since the establishment of the institution. The income had been £129 3s. 11d., the expenditure £119 19s. 3½d., leaving a balance in hand of £9 4s. 7½d. *Library.*—The number of issues during the year had been 2,602, being an increase of 73 over previous year. *Classes.*—The elementary classes for young men and young women had made great progress. A Government science class was established last winter, and had been very successful. *Results of Examinations.*—Elementary certificates had been obtained by four female candidates. Four certificates had been awarded by the Society of Arts. Nine candidates had passed at the Government Science Examinations, held in May last, and certificates had been awarded by the Union of Lancashire and Cheshire Institutes to two candidates who had passed a special examination in social economy. In consequence of a grant of £400 by the Relief Committee, for the purpose of erecting a new institution, five trustees had been appointed, and the committee for the ensuing year was constituted the New Building Committee. The prizes and certificates were distributed by J. Mitchell, Esq., who made a few very appropriate and encouraging remarks to each successful candidate. Addresses were afterwards delivered by Messrs. J. Mercer, jun., Thomas Lawton, visiting agent to the Union of Lancashire and Cheshire Institutes, and William Gunn, Government Science teacher. Local prizes amounting to £4, were offered to the most successful candidates of the next year's examinations.

FREE TRADE AND THE REPEAL OF THE NAVIGATION LAWS.

The following Memorandum, issued by the Board of Trade, is intended to exhibit the progress of British commerce, navigation, and revenue during recent years, and to illustrate the results of the adoption by Great Britain of a system of commercial freedom, and the repeal of the Navigation Laws:—

Whilst the increase of productive power and other causes have, without doubt, materially operated in effecting the vast development indicated in this memorandum, these resources must have remained in a great degree unprofitable had the former restrictions on British trade and navigation been still maintained.

Exports and Imports.

The official value of British and foreign and colonial exports and imports combined were as follows, in the years 1842, 1853, 1863, 1864, and 1865 respectively:—

1842	£179,095,088
1853	365,171,537
1863	485,027,040
1864	496,067,717
1865	545,873,160

Of these amounts the official values of the imports were—

1842	£ 65,253.286
1853	123,099,313
1863	171,913,852
1864	175,961,690
1865	181,806,048

During the snme years the corresponding values of the exports of British and Irish and foreign and colonial merchandise were—

1842	£113,841,802
1853	242,072,224
1863	313,113,188
1864	322,106,027
1865	363,067,112

Of these amounts the official value of the proportion of exports of British and Irish manufactures, &c., was—

1842	£100,255,380
1853	214,327,452
1863	258,198,551
1864	267,150,982
1865	301,612,902

The real value of British imports can only be ascertained since the year 1854. In that year they amounted to £152,389,053, whilst in 1863 they had increased to £248,980,942, in 1864 to £274,863,924, and in 1865 to £271,134,969.

The real values of the exports from the United Kingdom in the years 1854, 1863, 1864, and 1865 were—

1854	£115,821,092
1863	196,902,409
1864	212,588,239
1865	218,858,316

The real values of these exports cannot be given previously to 1854, as such values of foreign and colonial merchandise were not ascertained until that year.

The real value of exports of British and Irish manufactures during the years 1842, 1853, 1863, 1864, and 1865 respectively, was—

1842	£ 57,381,023
1853	98,933,781
1863	146,489,768
1864	160,449,053
1865	165,862,402

The immense development of this branch of our commerce during recent years will be more readily appreciated when it is remembered that the figures for 1842 are but little in excess of the average value of our exports during the thirty preceding years.

In the years 1854, 1863, 1864, and 1865 the real values of our exports of foreign and colonial merchandise were—

1854	£18,636,366
1863	50,300,067
1864	52,139,186
1865	52,995,914

The quantities of the various principal articles of food below mentioned, and now admitted duty free, were as follows for the respective periods:—

	1842.	1853.	1863.	1864.	1865.
Horned cattle .... No.	Prohibited	125,253	150,898	231,733	283,271
Sheep .... ,,		259,420	430,788	496,243	914,170
Bacon and hams .... Cwts.	8,355	205,667	1,877,813	1,069,390	713,346
Butter .... ,,	175,197	403,289	986,708	1,054,617	1,083,717
Eggs .... No.	89,548,747	123,450,678	266,929,680	335,298,240	364,013,040
Rice .... Cwts.	511,414	1,504,629	3,070,292	3,187,650	1,941,580

The quantities retained for consumption of the following articles, which are still subject to Customs' duties, were:—

	1842.	1853.	1863.	1864.	1865.
Cocoa .... Lbs.	2,246,569	3,997,198	3,712,287	4,171,142	4,286,635
Coffee .... ,,	28,519,646	36,983,122	32,762,995	31,589,597	30,748,349
Sugar, raw .... Cwt.	3,868,437	7,272,833	9,202,524	9,189,127	10,187,146
Tea .... Lbs.	37,355,911	58,834,087	85,183,283	88,637,199	97,921,944
Tobacco, unmanufactured ,,	22,013,146	29,348,598	36,751,173	37,189,856	38,341,644
Wine.................. Galls.	*4,815,222	6,813,830	10,422,105	11,456,531	12,061,386

The declared or real values of the more important articles of British manufacture exported during the same years are as follows:—

	1842.	1853.	1863.	1864.	1865.
	£	£	£	£	£
Apparel, haberdashery, and millinery................	1,143,270	6,923,190	7,169,975	7,376,970	7,653,706
Cotton yarn	7,771,464	6,895,653	8,019,954	9,083,239	10,351,049
,, goods	13,907,884	25,817,249	39,424,010	45,799,090	46,903,796
Earthenware and porcelain....	555,430	1,338,370	1,334,275	1,422,014	1,442,934
Hardware and cutlery	1,398,487	3,665,051	3,826,784	4,334,273	4,334,273
Leather and leather wares	400,927	1,578,595	2,319,763	2,408,306	2,462,100
Linen yarns	1,025,551	1,154,977	2,535,728	2,991,969	2,505,497
,, manufactures	2,346,749	4,758,432	6,509,970	8,172,813	9,155,358
Machinery	554,653	1,985,536	4,365,023	4,848,592	5,213,530
Iron and steel................	2,457,717	10,845,422	13,111,477	13,310,484	13,451,445
Tin plates	363,685	1,181,069	1,311,850	1,263,246	1,482,766
Silk, thrown and manufactured	590,189	2,044,361	2,229,591	2,214,927	2,177,285
Woollen yarn................	637,305	1,456,786	5,065,432	5,417,377	5,424,047
,, manufactures	5,185,045	10,172,182	15,518,842	18,533,497	20,102,259

---

* **The importation of wine in 1842 was unusually small, the average importation from 1840 to 1848 having been nearly 6,500,000 gallons.**

Notwithstanding the great increase here indicated with regard to British imports and exports, it must be borne in mind that few countries have yet comprehensively adopted a liberal commercial policy, and that, consequently, the measures in that direction, which have already been for some years fully applied by Great Britain, cannot be said to enjoy the conditions necessary to the complete development of the system.

NAVIGATION.

The tonnage of British and foreign vessels which entered and cleared in the United Kingdom with cargoes, in the years 1842, 1853, 1863, 1864, and 1865 respectively, was:—

	1842.	1853.	1863.	1864.	1865.
	Tons.	Tons.	Tons.	Tons.	Tons.
British	5,415,821	9,064,705	15,263,047	16,409,413	17,413,643
Foreign	1,930,983	6,316,456	7,762,116	7,065,471	7,572,202
Total......	7,346,804	15,381,161	23,025,163	23,474,484	24,985,845

The coasting tonnage of the United Kingdom has likewise increased greatly, notwithstanding the severe competition of the inland railway carrying trade, as is shown by the accompanying figures of the tonnage of British and foreign vessels engaged with cargoes in the coasting trade of the United Kingdom:—

	1842.	1853.	1863.	1864.	1865.
	Tons.	Tons.	Tons.	Tons.	Tons.
British	10,785,450	12,820,745	17,465,635	17,350,579	18,150,649
Foreign	None.	None	81,897	66,107	77,705
Total......	10,785,450	12,820,745	17,547,532	17,416,686	18,228,354

The tonnage of vessels built and registered in the United Kingdom in the years 1842, 1853, 1863, 1864, and 1865, was:—

	1842.	1853.	1863.	1864.	1865.
	Tons.	Tons.	Tons.	Tons.	Tons.
Sailing-vessels	116,213	154,956	253,036	272,499	235,555
Steam-vessels	13,716	48,215	107,951	159,374	179,649
Total	129,929	203,171	360,987	431,873	415,204

In addition to the above, the following amount of foreign tonnage was registered in the United Kingdom:—

	Tons.
1842	
1853	30,073
1862	74,629
1864	128,761

The total registered tonnage of the United Kingdom was in the same years:—

	Tons.
1842	2,990,849
1853*	4,030,204
1862*	4,934,400
1864*	5,627,500
1865*	5,760,309

The effective power of steam vessels being so largely superior to that of sailing vessels, lends considerable importance to the following figures of the steam tonnage on the register for the United Kingdom in the years 1851 and 1865 respectively:—

	Tous.
1851	186,687
1865	823,533

CUSTOMS REVENUE.

The revenue produced by the customs has been well sustained, notwithstanding the great reductions effected in our tariff since 1842. In that year almost every article imported was liable to a Customs' duty, and the list of tariff denominations amounted to many hundreds, whilst at present 12 leading articles alone are taxed on importation.

The gross customs' revenue, after deducting drawbacks, &c., amounted in the following years to:—

1842	£22,523,513
1853	22,515,913
1863-64	23,234,356
1864-65	22,527,573
1865-66	21,302,239

During the same intervals the excess of reduction of customs' duty above the amount imposed was:—

1843-53	£10,166,749
1854-63	4,458,166

The reduction in the same branch in the years 1864, 1865, and 1866, is, for each year respectively:—

1864	£1,744,384
1865	2,214,981
1866	477,000
Total	4,436,365

The amount of additional customs' duties imposed during the same period was only £1,576, arising from the increase in 1865 of the duty on sugar-cane juice for assimilative purposes.

The actual excess of reduction for the whole of the three years was therefore £4,434,789.

Thus, during the whole interval the customs' duties have been reduced by £19,059,704, or more than four-fifths of the whole customs' revenue in 1842; the revenue produced exhibiting a decrease of merely £1,469,076.

EXCISE REVENUE.

The gross amount of the duties of excise in the years 1842, 1853, 1863, and 1864, were:—

1842	£14,616,083
1853	16,303,237
1863-64	18,207,000
1864-65	19,428,324
1865-66	19,818,162

The relative additions and diminutions during the same periods were:—

1842-53	£2,486,000	Reduced.
1854-63	1,226,000	Imposed.
Excess of reduction of Excise duty............	1,260,000	
Reduction, 1864-66	95,000	
Total	1,355,000	Reduced.

Thus, notwithstanding the various reductions of excise duties, amounting for the whole of the above period to £1,355,000, the revenue obtained in 1865 from this branch of the public service had increased by £4,812,241 over the amount for the year 1842.

The total gross receipts of revenue of the United Kingdom during the three years were as follows:—

1842	£52,763,147
1853	57,535,215
1863-64	70,208,964
1864-65	70,313,437
1865-66	67,812,292

The gross revenue had therefore increased during the aggregate period from 1842 to 1865-66, £15,049,145, and that this increase was not due to augmented taxation is made evident by the following statement:—

*** The figures for these years include the registered tonnage of the Channel Islands and the Isle of Man, the amount of which may be estimated at about 100,000 tons.**

Excess of Total Amount of Customs, Excise, and other Taxation Repealed over the Amount Imposed during the Periods 1842-53, 1854-63, *and* 1864-66.

1842-53	£7,175,986
1854-63	4,407,966
Excess of diminution	11,583,952
,, ,, 1864-66	9,761,789
Total excess of diminution	21,345,741

or about 40 per cent. of the whole amount of the revenue of 1842.

The expenditure of Great Britain, which amounted, in 1842, to £55,223,874; was in 1853, £55,769,252; in 1863-4, £67,056,286; in 1864-65, £66,462,206; and in 1865-66, £65,914,357.

In 1842 the amounts of the unredeemed funded and of the unfunded debt were respectively:—

Funded	£773,068,340
Unfunded	18,182,100
Total	791,250,404
In 1853—	
Funded	£761,622,704
Unfunded	17,742,500
Total	779,365,204
In 1863—	
Funded	£777,429,224
Unfunded	13,136,000
Total	790,565,224
In 1865—	
Funded	£775,768,295
Unfunded	10,742,500
Total	786,510,795
And on the 31st March, 1866—	
Funded	£773,313,229
Unfunded	8,187,700
Total	781,500,929

The whole amount of the funded and unfunded debt stands at present, therefore, at £9,749,511 less than the amount which it represented in 1842.

PRESERVATION OF WINE.

The following is from *Morgans' British Trade Journal:*

The changes in the tariff, the largely increasing consumption of French wine in England, and other circumstances, have materially contributed, and are still contributing, to improvements in the making and the means of preserving wine. The readers of this journal have been informed of all the principal experiments that have been made in this direction, and have had the benefit of various opinions, *pro* and *con*, expressed by those whose views on the subject deserved attention. In France M. Pasteur has certainly occupied the most important place amongst scientific men who have taken up the subject of the conservation of wine earnestly, and his experiments and conclusions have been recorded from time to time in our pages.

The matter has just now received further and very important consideration, and with a result, as regards the opinion of practical as well as scientific men, that commands attention.

Some time since the Central Agricultural Committee of Sologne, at the instance of its president, M. Boinvilliers, senator, voted a gold medal, of the value of a thousand francs, "to the inventor of a process, to be made public, and which should enable French wines to be conveyed by land and sea, and to be kept in any climate without alteration of their flavour or bouquet." A commission was appointed to examine the subject, and the report of M. Dumas, the well-known chemist, member of the Institute, and senator, is now published.

The commission declares that M. Pasteur's experiments and researches have fulfilled the conditions laid down, that they have thrown the greatest light on the causes which give rise to alterations in wine, as well as upon the practical means which may be used to prevent the mischief, with certain success.

The report goes on to say that M. Pasteur, by the aid of experiments conducted with a profound knowledge of the natural laws bearing upon the subject, and aided by an intimate knowledge of the scientific means to be employed, has perfectly succeeded in establishing the five following propositions:—

1. That the dangerous changes which occur in wine arise from causes which are mixed up with those to which fermentation is attributed.

2. That the heating of ordinary wine to the extent of 50° centigrade is sufficient to kill all microscopic vegetation, or the ferments which produce them; fermentation and all other dangers due to these causes being thus arrested or prevented.

3. The application of the amount of heat indicated does not in any way effect the colour or the flavour of wine, and assures brightness.

4. Wines which have been submitted to such temperature appear capable of being kept indefinitely in closed vessels.

5. When exposed to the air such wines, it is true, may become effected after a certain lapse of time; but this is in consequence of the air supplying them with the living germs of those ferments which they previously lost by the action of heat.

The report then gives the results of M. Pasteur's studies of the various maladies which affect wines:—

1. *Acid or Pricked Wine.*—This acid is due to the presence of *mycoderma acetic*, which must not be confounded with *mycoderma vini* (the true ferment), which does not produce any change in wine, while the former, with the aid of the air developes vinegar, and renders the wine, sooner or later, acid.

2. *Wine turned.*—Sick, out of condition, but not pricked, owe the change to filaments of extreme thinness, which resemble and sometimes appear identical with the filaments of lactic fermentation. M. Pasteur, as well as M. Balard, has also found wine affected by the presence of lactic acid, but this is an uncommon case. The filaments in question resemble those of lactic acid, and, like the latter, are composed of strings of small bodies like pieces of the stalk of wheat or bamboo, but by means of the microscope the signs of many distinct maladies may be detected in wine which have been confounded under the same names, but which have nothing in common but the fact of their being produced by similar microscopic vegetation.

3. *Wines that have become Oily or Ropey.*—The cause of this change consists also of filaments, but, in this case, they are composed of grains, and not of rings or tubes.

4. *Bitter Wine, Wine that assumes premature Old Age.*—This change is also produced by filaments closely resembling those of the second case, but finer and less refined in shape. The same wines are not, however, subject to the changes described.

All these parasitic growths, says the report, and others which have been observed but not yet scientifically examined and determined, are destroyed by a temperature of 65°, or even 50° centigrade. In heating the wine, therefore, to a temperature within those limits, it is certain that all future change due to the action of these living vegetable matters becomes impossible, so long as no new germs are introduced by the admission of air, or by admixture with wine which has not been similarly treated.

In aqueous liquids about 100° of heat are required to destroy such germs, and sometimes even this is not sufficient, but, in the case of wines, the alcohol contained in them aids the action of the heat, and thus a lower temperature suffices.

M. Pasteur, who at first believed a temperature of 75° to be necessary, was able gradually to reduce it to 65° and 50°, and he thinks that it may be lowered even to 45°. This is a very important consideration, for it would be very easy to obtain from the sun's ray's falling on a closed chamber the last-mentioned heat, especially in the south of France, and thus avoid the cost and trouble of artificial heat.

M. Pasteur expresses his certain conviction that the air plays no part in the fermentations which produce changes in wine, acetic fermentation alone excepted; but his experiments show that the air acts upon wine deprived of all principles of fermentation, and that, with the aid of light, it takes away their colour, and communicates a flavour resembling that of Madeira.

Direct solar light has no influence on wine secured against the entrance of air.

The commission reports that it has examined with the most scrupulous attention the results recorded by M. Pasteur, and sanctions them with its entire approbation.

M. Marès, correspondent of the Academy of Sciences, has put in practice the system of M. Pasteur, for his wines of the Hérault, which are liable to alteration, and can only be kept by successive additions of alcohol; and he reports that when heated to 60° they keep perfectly.

The process of M. Pasteur then, says the report, will enable the wine-growers to make all their wines keeping wines, capable of travelling without danger, and of remaining many days open without becoming clouded or otherwise injured. The north and north-west of France may thus obtain wine cheaper yet more stable, and wines which heretofore were compelled to be consumed at home may be transported to the north. England, especially, receiving wine which will not require any particular care, for which long keeping will be unnecessary, and a bottle of which, after being uncorked, may be kept good in an ordinary apartment for a considerable time, will become an improving market. Everyone who has visited England has been impressed with the fact that the arrangements of the houses and the habits of life must be modified before the light wines of France, which require especial care, could come into general use; but the process of M. Pasteur, which renders such care useless, is of a nature to exercise the happiest influence in the extension of the trade with England.

Pure science, even in its more delicate forms and apparently useless discoveries, now imparts confidence and respect; but it may not be entirely without use to state, that this problem, the solution of which had been pronounced almost hopeless, has not been elucidated by any accident, M. Pasteur having proceeded from the outset by a chain of reasoning controlled by a series of experiments logically arranged, and rendered conclusive by their precision. The views by which he has thrown such light upon one of the most important economical questions, were first solidly established by him in the dom in of theory.

It need scarcely be added that, after the reading and discussion of such a report, the prize medal was voted to M. Pasteur without a dissentient voice.

OPENING OF THE FIRST LYCÉE FOR SPECIAL EDUCATION IN FRANCE.

The Lycée of Mont de Marsan, as remodelled on the new plan of special education, has been opened by M. Duruy, the indefatigable Minister of Public Instruction, and the novelty and importance of the new system of public education make it desirable to give the principal passages of the Minister's speech at length. The objects in view have been little understood by the public, and rather sharply attacked by some critics, so that M. Duruy's own explanation of the new plan of special education deserves particular attention.

M. Duruy, after alluding to the doubts thrown over the project of converting the old Lycée of Mont de Marsan into a special college, and stating that the applications for admission were far more numerous than could be met, said:—

"Classic literature formed the French mind. In its moments of weakness it was still at that fruitful source that it could refresh itself; and, if we desire to maintain purity of language, correctness of form in design, and exquisite judgment in thought, we must remain faithful to the grand antique. But in our busy society, every one has not the power or the leisure to abandon himself for long to Plato and Horace. When religion, philosophy, and science spoke Latin; when Condé went to the Sorbonne and took his part in the Latin dissertations, and Madame de Sévigné read Tacitus in the original; when, finally, the most popular book produced during the latter part of the reign of Louis XIV. might have been taken for a production of Homer or of Virgil, then there was but one system of education, that of ancient literature, and those alone were considered in the state who could attain it. At the present time multitudes aim at intellectual existence because they cannot live by their hands alone. The products of agriculture and industry amount to hundreds of thousands in value, and, thanks to the machines which science has invented, the muscular arm of man is almost disregarded by industry, and agriculture is daily learning to do without it. Before coming here I visited a manufactory in which a portion of the furniture and fittings of your Lycée were made, and amongst 3,000 workmen I found only ten who had to exercise any muscular power; but what address, what intelligence has each to exert now-a-days! It is no longer the man who labours and suffers in the flesh, but matter broken in which is made to toil in his place. . . . . . How many have we to execute this intelligent labour? An immense army, to which our great schools have furnished admirable generals and learned captains, but in which those who head the soldiers, and when necessary replace the leaders, are too often wanting. Still at the present time, when liberty of commerce has left the lists open to all comers, it is our duty valiantly to defend the French market, and to dispute the markets of the world with the producers of the universe. One of the conditions of success will be not to remain behind those people who have already outstripped us in the intellectual development of the labouring classes. France has 4,000 classical pupils in her lycées and colleges, which ensure a large supply to the liberal professions, and 5,000,000 of children in primary schools, who seldom go beyond elementary acquirements, when they reach so far. Between the two classes there is an abyss which only a few, specially gifted, succeed in crossing. Over this abyss we must throw a bridge, and special education supplies us with the means."

The speaker then alluded to a complaint made by Louis XIV., that the University did not teach practical science, and quoted a speech of Leibnitz, that, "The manual occupations ought to be presided over by real men of science, and the savants would then be the true preceptors of the human race."

"I do not hesitate to assert," continued M. Duruy, "that the greater portion of young men lose the time which they pass in the colleges, some from learning what is useless and sometimes hurtful to them, and others from not learning what it is essential for them to know. This is not nature's fault; she is more liberal than most people imagine—it is the fault of education if every man is not made serviceable. The principles of fertility are hidden in these wastes, which only required an able hand to bring forth abundant fruit. Out of these wastes the revolution tried to produce men, in planning a vast system of education which should extend to all the people 'the knowledge indispensable to artists and workmen of all classes.' The central school did not succeed. Fourcroy and Cuvier hoped at least to preserve the principle, but under Fontanes the University took a contrary direction, and, in spite of the efforts made during the last fifty years by the most eminent men whom the Ministry of Public Instruction has had at its head, or in its councils, we are still following the route marked out by the old Universities. Shall we be more fortunate than our predecessors? The future will tell; but I may be allowed to say that my confidence is complete. Without faith nothing succeeds, and I possess faith in my work—this, then, is a first element of success. Let me add that I can count, for advice, on all the notabilities of the country—and for action on the whole University of France. With such auxiliaries it is not presumptuous to calculate on victory.

"You know the organisation of Special Instruction; but it is not out of place here to recall its principal characteristics:—

"Its object is the diffusion of fundamental and useful knowledge — moral and religious education, French language and literature, history and geography, arithmetic, accounts, and ordinary legislation—these form the foundation necessary for all the world. The sons of merchants, manufacturers, and agriculturists will add thereto, according to their requirements, the living languages, drawing, and the practical applications of mathematics, chemistry, physics, and natural history, which of itself forms the materials of all the common arts and the highest forms for the development of the plastic arts.

"The peculiar character of special instruction is its variety, in contradistinction to classical education, which is and should be uniform from one end of France to the other. All the Lycées are alike: all the special schools should differ, for in these the education should be determined by local necessities. I have even carried out this principle so far as to arrange elements of education in a programme extending over five years, so that a child compelled to stop at the end of the first, second, or third year shall still carry away with him something useful. As I have already said, it is a system of concentric circles, constantly increasing in diameter with the progress of the pupil, who will, however, always obtain first what he most requires. If he proceeds to the end it will be well; if he halts on the road he will at least not have lost all, like the scholar who quits the Latin Lycée when on the third or fourth form. Classic study is an arch which is only of use when the keystone is in place, and this can only be done in the upper classes of rhetoric and philosophy.

"The formula which best represents the idea of the new plan of studies will then be—to each according to his wants and to his capabilities.

"In order to assure this liberty of plan to the new instruction, and to secure for each locality the studies which it requires, a council of improvement is attached to each special school, and this council will be composed of the commercial and industrial notabilities of the town, presided over by right, not by a member of the University, but by the *maire*, the natural representative of every father of a family in the city. This council is invested with important attributes. It will choose from the general official programme the parts which it thinks fit; it will assist at the classes; take part in the examinations; have charge of the museums and collections; help those who are quitting the school to employment best suited to them; and report to the minister annually. Local influence will thus have free exercise; this is scholastic decentralization in the widest sense.

"From eight to eleven years the pupils will follow the primary courses; from twelve to sixteen, the special courses, terminating with a public examination before a departmental jury, which will grant diplomas that will be issued by the minister in the name of the Emperor, and which will, doubtless, find favour in industry as well as with the great administrations.

"If amongst the pupils of the special schools it happens that fortuitous circumstances and special aptitude lead some of them towards the study of the ancient languages, a series of lessons will prepare them for following, after the special examination, a course of Latin which in a year or two will lead them to one of the bachelorships, perhaps to both, and consequently to the great government schools, as well as to the liberal professions. In this case, the pupils will finish instead of commencing with classical studies, and they will proceed all the more rapidly from the fact that their minds have been prepared beforehand by studied and various cultivation. I am not here nursing vain illusions; the pupil who this year has gone out first from the Polytechnic school followed this very method, only it was not so decided and firm as it is now.

"The course adopted by you has already been followed by Mulhouse, Forbach, Sainte Marie aux Mines, Bruyères, Parthenay, Lectoure, Tournus, and Montélimart, and it will shortly be by Cognac, Clermont sur Oise, and twenty other towns where the change is in preparation, for this change is the only healthy course for the greater number of our 251 communal colleges.

"Do you know what those 251 colleges cost annually? More than eleven millions (£440,000); and they produce 253 *bacheliers-es-lettres!* . . . . .

"Instruction will thus be offered to all and every one, not forcing any one out of his place, but raising everyone within his own sphere; the field labourer and the artizan by the primary school; the manufacturer, merchant, and agriculturist by the special college; and the magistrate, the savant, and the man of letters by the classical Lycée and the superior school. . . . . A great capital, the most precious of all, is left dormant at present with a considerable part of our population, that which nevertheless forms our great reserve of force and intelligence, and you know that the constant thought of the Emperor is 'to fortify the body and elevate the soul of the nation.'"

The new Special College of Mont de Marsan opens with two hundred scholars, but as many more have been refused for want of accommodation. The Normal Special School of Cluny numbers already twenty-one pupils. It may be added, too, that in the department of the Loire, where special education was introduced before the present system was inaugurated, the diplomas are highly esteemed, and the pupils afterwards find good employment for their talents.

The Minister of Finance has just announced that candidates for situations in the post-office and in the offices of taxes and customs, holding special education diplomas, will henceforth have a certain number of marks or other advantages awarded them.

Fine Arts.

◆

SCHOOLS OF ART: NEW MINUTES.—Information received from Bristol indicates that the effects anticipated by masters and local committees from the late new minutes have already set in. Those minutes empowered the holders of second grade certificates to teach night classes in Mechanics' Institutions and national schools, and thereby win rewards which had previously accrued only on instruction by art teachers possessed of the higher qualification known as "the master's certificate." It was objected a year ago, at the deputation to the Lord President of the Council, headed by Sir Stafford Northcote and including twenty members of Parliament and representatives from thirty-five schools, that to empower the holders of the second or elementary certificate to set on foot, under express Government reward, independent art classes would weaken the existing schools of art, diminish the income of the highly qualified masters, and authorize an art instruction of a quality below the standard of that hitherto maintained by the holders of the higher certificate. On the other hand, the Committee of Council on Education have a right to urge that, under this new provision, art education will be diffused all the more widely and at a cheaper rate among the industrious classes, for whose benefit schools of art were mainly established. The qualification of the persons who are now coming into the field as teachers is indicated by a statement made by Mr. Walter Smith, master of the Leeds Schools; he says that, at a recent "examination of that school, no less than eleven pupils, mechanics, joiners, and school-boys, took the second grade certificate in Leeds, after a few months of casual study." The accounts from Bristol state that the benefits offered by the new minute to those who possess the certificate of the second grade are being taken advantage of by teachers in that neighbourhood, and a printed bill has been issued which announces that at a British School in that city, "drawing classes will be opened in connection with the Science and Art Department," in which the master, a holder of a second-class certificate, will instruct pupils in "free-hand, model and geometrical drawing," "perspective, mechanical, and architectural details, together with figure and landscape sketching if required." It is further announced that "a Government examination will be held in March, at which all students will be eligible to sit, and if successful will receive certificates of merit, prizes in books, colour boxes, instruments, &c." The Bristol School of Art, in common with other schools throughout the country, suffers from the opening of these night classes. Before the recent minutes, the committee of the Bristol School had made, in concert with the masters, considerable efforts, in the interest of national education, to extend art-instruction to schools for the poor. This part of their duty they are now compelled to suspend. Yet Bristol has, by public subscription, built a commodious school, and the expense of maintaining it is in part borne by annual subscriptions, of which the committee pay a large share. This state of things in the west is said to be an index to the situation, under the new minutes, of schools of art in other cities.

Course of Study at the Paris School of Fine Arts.—Since the reorganisation of this school, constant improvements have been made in the course of studies, and it will not be uninteresting to give the heads of the course just published for the session which commenced on the 3rd instant. There will be thirteen lectures a week; two of these are addressed especially to pupils in the class of painting, and two to those in the architectural class; the remainder apply to all the classes. The professors are eight in number. The mathematical chair is filled by M. Francœur, who will treat twice a week of conic sections, statics, the centre of gravity, machinery, plan drawing, and superficial and solid mensuration; M. Chevillard lectures on perspective, once a week for the painters, and once for architects; M. Ossian Bonnet treats twice a week on descriptive geometry; M. Baude also twice a week on practical construction, administration, and accounts; M. Pasteur, director of the scientific studies at the Ecole Normale, or his colleague, M. Cloez, will lecture once a week on geology, physics, and chemistry; Mr. Huguier will deliver two lectures a week on anatomy; M. Heuzey once a week on history and archæology; and M. Taine once a week on æsthetics and the history of art. Each of these gentlemen occupies a high position in science or literature, and some of them are amongst the most popular professors of the day. To complete this account it should be added that the studios of the school are directed by the painters Cabanel, Pils, and Gérôme; the sculptors Dumont, Jouffroy, and Guillaume; the architects Constant Dufaux, Paccard, and Laisné Charles; the engravers Henriquel Dupont, and Farachon; the greater portion of whom are members of the academy of the fine arts in the Institute of France.

Manufactures.

Deposition of Metals.—The following is the account given by Dr. Dullo, in the *Journal d'Industrie*, of the method adopted in Germany for covering cast-iron objects with copper. The surfaces are cleaned with a brush and hydrochloric acid, and the objects are then left in water slightly acidified; they are afterwards placed in a bath composed of 25 grammes of oxyde of copper, 170 grammes of hydrochloric acid, a quarter of a litre of water, and half a litre of alcohol. A regular deposit of copper takes place on the surface of the iron, the rapidity depending upon the proportion of the alcohol, which is the active agent, to the other ingredients. The iron may be coated with the aid of pure alcohol only, but in this case the deposit is very thin, and in the form of chloride of copper, which is converted in the end into metallic copper. The chloride which adheres to the surface should be carefully brushed off after the operation, and the surface dried. If iron thus coated with copper is placed in a bath consisting of 10 grammes of chloride of iron and 1½ litre of alcohol, in contact with metallic zinc, the surface is covered with a fine silvery deposit, which adheres firmly to the copper. Copper may also be covered with a layer of antimony by the following process:—Dissolve chloride of antimony in alcohol, and add hydrochloric acid until the mixture becomes clear, clean the copper well and leave it in the bath for three quarters of an hour. The effect of the alcohol in the preceding processes is thus explained; it moderates the precipitation of one metal from its solution by another metal, and causes the precipitate to fall in an extremely divided state; when alcohol is used alone, without water, the coating of copper thrown down is reduced to the last degree of tenuity. It is recommended that when the work is finished it should be well washed, first in water, and afterwards several times successively with a solution of carbonate of soda, and with weak hydrochloric acid, and finally carefully dried in a warm place. The perfect silvering of vases, or plates of glass, is always a matter of some difficulty, and M. E. Reichardt recommends the following method:—Prepare four solutions—first, 10 grammes of nitrate of silver to 100 grammes of water; second, an aqueous solution of ammonia, of 0·984 density; third, 20 grammes of caustic soda and 500 grammes of water; and fourth, a solution of 25 grammes of sugar in 200 grammes of water, to which is added a cubic centimètre of nitric acid, at 36°; and let the whole boil for twenty minutes. When cold add 50 cubic centimètres of alcohol, and as much water as will make up the total quantity to 500 cubic centimètres; then take 12 parts of the first, 8 parts of the second, and 20 parts of the third solution, add 60 parts of water, and let the mixture stand for twenty-four hours; lastly, the solution No. 4 is added, when the whole becomes of a blackish tint, in consequence of the finely divided precipitate of silver which begins to fall. M. Reichardt has discovered that the deposition of the silver is greatly aided by motion, and that when the bath is continually shaken the deposit on the inner surface of glass vases is always satisfactory, and he recommends that in silvering plates of glass they shall be placed in evaporating dishes, or other vessels, so that the sides may give an oscillating motion to the liquor in the bath when shaken. In acting on large articles he recommends the glass plates, or other objects, to be fixed within tubs or vats, which may then be rolled or rotated pretty rapidly.

Commerce.

The Condition of the Tea Trade.—On this subject *The Produce Markets Review* says:—Of all the articles of produce imported from abroad, tea, estimated by the computed value of the imports, stands fifth in the list, whilst of those on which duty is paid it stands second. Taking the official returns for the year 1865 as our ground of comparison, we find the computed values of the year's imports of cotton, corn, wool, sugar, tea, to be as follows:—Cotton, £66,032,193; corn, £20,724,115: wool, £14,930,430; sugar, £11,303,115; and tea, £10,044,462. There can then be little doubt as to its value and relative rank as compared with other articles of trade; and whatever amount of reflected credit attaches to reformers of trade customs in our most necessary articles of consumption, should belong in an especial degree to those who wish to improve the condition of the tea trade. In wealth, in their knowledge of trade, in the stability of their credit, the tea merchants and tea brokers are inferior to none in commerce. On every ground, then, we are not unreasonable in expecting from those who have the management of the tea trade something more nearly approaching completeness than we are likely to find in smaller trades of less wealth and advantages. But practically, the contrary is the case, and the whole tea trade is in an utterly disorganized state. Whether we consider the inconveniences arising from the present barbarous system of "clearing," the delays in the delivery of weight notes; the variations in the brokers' estimates of market value; the balloting for order of sales, the intervals between sales, the separation of sales of Chinese from sales of Indian teas; or the more serious evils of "coaching" and "buying over"—we shall find that there is hardly a single department in which reforms are not imperatively called for. The tendency of most inconveniences is, by gradually increasing in intensity, to promote their own eradication; and when things comes to the worst, some simple and summary method is generally extemporised which will give the relief sought for. It is surprising, however, how long-suffering people are when once habituated to a state of things, even when it is acknowledged to be unsatisfactory. The system which permits sales to be announced, bids to be made, and all the formalities regularly performed, when it is known that not a bid is to be expected unless an especial pledge to sell is given in print, and when that pledge is omitted, is surely farcical. The opinion entertained by the public of this mode of procedure is sufficiently indicated by the fact that they will assist only at those sales which are announced as "without reserve." In this instance, as indeed in all cases where there is any deviation from right principles, the disengenuous attempts to influence markets by announcements of sales never intended to be made recoils on those who first led the way; and intending purchasers reserve their opinions and their money for those lots which are put up with the *boná fide* intention of being sold, in accordance with trade regulations, to the highest bidder. The habit of sending samples daily to the wholesale houses with prices far above market value marked upon them, or left for bids to be made with no price at all given as a guide by the brokers, appears equally unbusiness-like, and must arise from an uncertainty in valuing, such as a system of *boná fide* public sales of all kinds of tea would at once cure, by establishing standard values for the day. By holding sales of China tea only once a fortnight, by the still greater absurdity of omitting the series for three weeks when five Tuesdays occur in a month, and opposing the sale of first-hand teas by auction, much mischief is done, as the insensible influences on value of regular daily transactions is lost, and the values of the better kinds is to be ascertained only by private offers to the wholesale trade, and a quiet comparison of their bids, which serves no purpose but that of making an apparent mystery of the art of selling tea which does not really exist. The number, variety, and long continuance of the several inconveniences enumerated point to the existence of a radical defect—the want of some recognised authority to take cognizance of the whole subject, and to carry out such alterations and modifications as the spirit of the times and increasing trade may render desirable. Surely a system which was suited to a trade of 20,000,000 lbs., wants many alterations to adapt it to the present trade of 140,000,000 lbs.; and the longer reform is delayed, the greater will the confusion become. It is now more than thirty years since the first public sales of tea took place, and the enormous strides that have been made in every other branch of commerce should not be without some corresponding improvement in this department. The first step wanted is a voluntary resignation on the part of the leading brokers and merchants of that dictation which was suited only to a small trade, and which has been exercised of late years apparently simply for obstruction, with the object perhaps of attempting to maintain a monopoly which the increase of trade had endangered. The course of things has, however, rendered the old system impracticable; for instance, it is impossible that sales which were calculated to serve 1,000 packages should be equally effective for 50,000 packages. During the last ten years the quantity of tea retained for home consumption has increased year by year, without a single exceptional decline, from 63,000,000 in 1856 to 98,000,000 in 1865. A consideration of this circumstance alone would suggest the absolute necessity of adopting arrangements to meet the requirements of an augmented and still augmenting consumption.

FISHERIES AND USE OF FISH IN NORWAY.—The late exhibition of fishing implements, tackle, and accessories at Boulogne has drawn great attention to the admirable uses and methods connected with the fisheries and the application of fish in Norway. The number of items exhibited by Norwegians at Boulogne was as large as that of the French, namely, about a thousand, a fact not at all surprising when it is remembered that the people of the western slope of the Scandinavian Alps possess few forests and scarcely any arable land, and are forced to seek a large portion of their food in the seas which bathe their rocky coasts,—seas that are broken up by innumerable islands, and the shores of which are indented with bays of all sizes and shapes, so that the whole forms, as it were, a grand natural reservoir for the finny tribes. The ingenuity of the Norwegians has discovered a hundred ways of pleasing the palate of the home consumer, and increasing the export of articles derived from the sea. Preserved fish and portions of fish, such as roes and sounds, salmon and lobster patties, or rather pasties or *patés*—for the first word gives an idea of something small, whereas these and other *patés* well known on the Continent resemble in size the famous venison pasties of the olden time in England, and are often a yard or more in length—preserved mussels, lobsters, prawns, and a dozen other articles make up altogether a very considerable trade. Amongst the most peculiar preparations of Norway, however, are the fish flours, *farines de poisson*, as they are called; they are composed of the flesh of fish reduced to powder, with some additional substances, and the biscuits made from these flours are said by certain chemists to contain four times the nutritive matter of beef, and sixteen times that of milk or rye bread. The *farine de poisson* is also used in place of rice and potatoes; and the dishes prepared from it are served at Norwegian tables with the poultry, and are said to be very palatable. The refuse of the fish-curing establishments, and all the uneatable portions of the fish are employed in the manufacture of a manure called fish guano, and which sells at the rate of £5 or £5 10s. per ton. It is principally sent to North Germany. The Norwegian system of fishing resembles that of England; large well-boats are made use of for the taking of the fish, which is carried to market by smaller and swifter vessels; but the Norwegians have introduced into their system features unknown in ours. It was found that long confinement in fishing boats had a serious effect upon the health of the men, who could in such vessels obtain little real repose from their labours, and therefore the Norwegians invented the inn-boat, or floating *maison de santé;* these boats are divided into large private cabins, well ventilated, and comfortably fitted up, and have all the arrangements for cooking on a large scale. The fishermen, when overfatigued or ailing, are transferred to inn-boats, and are thus able to escape many attacks of illness, and to recruit their strength. Amongst the novelties recently introduced or invented, is a van for the transport of live fish; the body is composed of tinned iron, and the water is kept in a state of freshness by means of a current of air, kept up by mechanical arrangements. It does not, however, appear that this mode of conveyance has yet been introduced into actual practice.

Minerals in Spain.—A discovery of a bed of natural phosphate of lime, near Merida, in the centre of the Estremadura, has been made by M. de Luna, who in 1865 was intrusted with the surveys for the line that is to unite Madrid and Lisbon, by crossing the western part of Spain, and passing by Talavera de la Reina, Merida, and Badajoz. This bed is of a mountainous form, and very abundant and easy to be worked in open cutting. An English and Portuguese company have made use of it for agriculture, and this valuable material is transported at a great expense across Portugal. In Spain they do not even think of making use of it, and in Portugal it is scarcely used. In the western part of Spain there are lead and silver mines in the whole of the provinces of Murcia and of Carthagena; immense deposits of sulphur in the provinces of Lorea and of Almeria; nitrate of potash everywhere, only requiring to be washed from the earth; deposits of manganese and iron at Cabo de Gato. Copper mines of immense wealth, abandoned since the time of the Romans, are situated in the province and near the town of Granada. The famous mines of sulphate of copper in the province of Huelva, are worked by the English and French. Mountains of natural sulphate of soda exist in the environs of Toledo. The Estremadura is rich in lead, silver, copper, and, above all, in natural phosphate of lime. Lead and tin, and evén zinc, are found to the north-west, in the province of Santander. To these may be added a fertile soil, an Italian sky, the date palm, that produces an excellent fruit, in the province of Alicante, and in Elchi a quantity of palm trees, that even the Algerian provinces do not possess; a great part of the soil arranged by the Moors for irrigation, and all these advantages should make Spain a country as powerful and prosperous as it is poor and degenerate. To return to the discovery of M. de Luna, the natural phosphate of lime, the samples of which he forwarded to the Academy of France, contain 60 per cent. of tribasic phosphate of lime. It, therefore, would be easy to manufacture from it the acid phosphate of lime, at a low price, by means of the sulphurous acid of Almaden.

Colonies.

Farming in New South Wales.—There have been heavy rains throughout the country, more particularly in the central districts and New England, and the squatters have better prospects than they have had for some time, stock are rapidly bettering their condition, and there is a good supply of fat cattle in the markets. The lambing is expected to be excellent. At a comparatively small expense water has, in most cases, been procured in the neighbourhood of Lachlan, at a depth of between 100 and 200 feet, and the supply is very large; one well is said to be capable of watering no less than 10,000 sheep daily. This is enough to show that the productiveness of sheep farms might be increased were the runs fenced. The roads in many districts are very bad, and in some places almost impassable, and, should the rains continue, it will be difficult for the squatters to send their produce to market. According to a report published by the Government Scab Inspector, this disease is nearly extinct. The total number of sheep infected during the late outbreak was 350,000, of which about 300,000 were destroyed. The "Free Ration System" has been for some years past one of the squatter's greatest grievances, and one with which it has been found very difficult to deal. Every idle loafer roving about the country seems to imagine that he has a prescriptive right to demand food and lodging at the squatter's expense; and on some stations through which there is a large traffic three or four of these vagabonds quarter themselves nightly upon the unfortunate grazier. They never work if they can help it, but walk about from place to place, feeding at the expense of all the squatters who will accommodate them, and food and shelter are very rarely refused in the bush. This system is so great a tax that on some stations the cost of the free rations given to travellers amounts to about £800 per year.

New South Wales Sugar.—The culture of sugar is exciting some little attention in this colony, particularly among the farmers on the Hastings, the soil of which locality is said to be admirably adapted for sugar-cane. There are now about fifty acres of cane growing on the Hastings River, and it is said that the cane, when crushed and manufactured, will yield a nett profit to the growers of about £80 per acre. Mr. E. Holland, of Port Macquarie, is understood to be preparing a parcel of sugar for the Paris Exhibition, which it is anticipated will place the capabilities of the colony as a sugar-proing country in a favourable light.

The White Ant.—The Rev. Z. Barry, of St. Jude's, Randwick, states that the only timber that can effectually resist the white ant is the Jarrah, or Western Australian mahogany. "This," he says, "is never eaten by anything, and never decays in the ground." Sooner or later it seems likely to be used in many localities for posts and rails, for railway sleepers, for wharves, and for the ground floors of houses.

Queensland Statistics.—The following is a return issued by Government of the lands leased, granted, or sold during 1865:—Sold by public auction, 36,058 acres; privately, 102,796 acres; under agricultural reserves, 6,944 acres; total, 145,798 acres. There were leased during the year 7,578 acres, and granted for several purposes 933 acres. As compared with the returns of 1864, the sales of land in 1865 show an increase of 5,985 acres. The proceeds of the land sold in 1864 were £210,725, and in 1865, £224,403, showing an increase of £13,677 in favour of the latter. The total quantity of land sold before and since the establishment of this colony, 580,034 acres. The estimated value of imports and exports for the year 1865 are as follows:—Imports, £2,505,559; exports, £1,153,464; total trade, £3,659,023. As compared with the trade of 1864, the imports of 1865 show an increase of £337,605, and the exports show a decrease of 93,500. This decrease is owing to the comparatively small quantity of wool shipped. Wool is the only article of Queensland produce that does not show an increase in the Customs' returns for 1865, as will be seen by the following table of the quantities of colonial produce exported in 1864 and 1865:—

	1864.	1865.
Cotton	38,730 lbs. ..	145,820 lbs.
Gold dust....	22,037 oz. ..	25,338 oz.
Hides	32,457 ..	45,511
Arrowroot ..	5,343 lbs. ..	12,141 lbs.
Copper ore ..	29 cwts...	4,424 cwts.
Wool........	14,006,789 lbs. ..	12,251,841 lbs.
Tallow......	1,137 tons ..	1,940 tons.

The following is a return of the stock of animals at the end of December, 1865:—Horses, 51,091; horned cattle, 887,856; sheep, 6,810,005, and 14,888 pigs, showing a total increase for the year of 1,146,671. The total quantity of land under cultivation on December 31st is 14,414 acres, showing an increase of 2,407 acres over last year's return. On 31st December, 1864, the population of the colony was as follows:—45,516 males and 28,520 females, and had increased in 1865 to 53,297 males and 34,478 females. In 1865 there were 31 Government schools; the average attendance of pupils was, daily, 2,981; the total expenditure for same being, exclusive of cost of building, £659,899.

Notes.

APPARATUS FOR SAVING LIFE.—The inundations that have recently taken place in France have shown how very necessary it is to establish a communication, by some simple means, between two points rendered inaccessible by the water. M. Gustave Delvigne has invented an arrow to carry a line that may be easily used to render assistance in such circumstances. There are everywhere a great number of guns available, either muskets of the soldiers, carbines of the gendarmerie, or fowling pieces. The average calibre is from 17½ centimetres to 18 centimetres. This arrow, for the purpose of carrying a line, consists of a rod of wood 1·10 to 1·20 metre in length, and 14 to 15 milimetres in diameter, of ash, or any other flexible and straight grained wood. At the end which rests on the charge a copper ferule is fixed with a small pin, 15 to 20 millimetres in height, and half a millimetre less in diameter than the calibre of the gun. This ferule thus forms a projection, a stop at the back of the arrow. In urgent cases this stop might even be made by a little pin driven through the wood. An arrow thus prepared would weigh 180 to 200 grammes. For a fowling piece, the barrel of which is shorter, the weight of the arrow is reduced by a third, and also the charge of powder. At the front of the arrow is placed a loop, formed by the end of a line of about 60 centimetres in length, firmly fastened by means of splice or a ligature. At the middle of this doubled line two strong ligatures are made with fine twine, so as to form a ring clasping the rod tightly. In this manner the doubled line forms two loops of equal lengths on each side of the ring. Below and against this fastening a noose is formed with the end of a line of the same size, with five or six turns tight round the rod. Finally the line to be carried is fastened to the loops. This line, 100 metres in length, and from 2½ to 3 millimetres in diameter, is wound on a conical mandril, which is taken out when the ball of line is completed, and the end within the ball is that which always should be attached to the arrow. If necessary the balls of twine sold by the rope makers, and which are easily unwound from the interior, may be used. This done, the gun or musket is then loaded with a charge of from 2 to 2½ grammes of powder (about half an ordinary charge), then two good wads of felt are rammed in, or else a strong paper wad. The arrow is then put in (the wood of which should be first slightly greased), and is well pressed down to the wad. The gun is pointed at an elevation of 25 to 30 degrees in the direction required to send the line. In the firing the fastening and the noose slide stiffly the whole length of the arrow as far as the projection or stop on the ferule. By this means the inertia of the line to be carried is gradually checked, and the shock that would be liable to break the line is prevented.

PRESERVATION OF BUTTER IN FRANCE.—One part of sugar, one part of nitre, and two parts of salt reduced to a very fine powder constitute a good mixture for the preservation of butter. Sixty grammes, or rather more than 2 oz. of this mixture, is sufficient for a kilogramme, or about 2¼lbs. of fresh butter, which, thus prepared, remains very good a fortnight afterwards; its taste is very soft and agreeable, and it will last for years. There is also another mode of preserving, viz., the butter is melted and purified with honey, 60 grammes of which is used for each kilogramme, the two substances being mixed with care. An agreeable flavour is obtained, and it will remain good a long time.

THEATRES IN EUROPE.—The total number of theatres in Europe is 1,581. Of this number there are 150 in Great Britain; 337 in France; 346 in Italy, comprising Venetia; 168 in Spain; 150 in Austria; 191 in Germany; 44 in Russia and Poland: 34 in Belgium; 23 in Holland; 20 in Switzerland; 18 in Sweden and Norway; 15 in Denmark; 16 in Portugal; 4 in Turkey; 4 in Greece; 3 in Roumania; and 1 in Servia.

POPULATION OF NORWAY.—The following are the principal results of a census that was made the end of last year in the kingdom of Norway. The total population of Norway amounted, to 31st December, 1865, to 1,701,478 persons; and this shows an increase of 211,431 persons during the last ten years. This increase would have been greater had it not been for the emigration which has during the same period taken off 40,000 inhabitants. The population of the towns, amounting to 211,515 persons in 1855, has increased to 286,149 in 1865, showing thus an augmentation of 74,634, or 35·3 per cent. In the country the increase during the same period has only been 10·7 per cent. The cold and damp climate of Norway, but little favourable to agriculture, explains this difference in the increase of the population of the towns, where, thanks to trade and manufacture, subsistence is easier than in the country. Finally, the census states that in Norway there are 3,294,087 head of cattle, or 6,187 more than in 1855.

ARCHIVES OF VENICE.—Public attention has been turned lately, and not without reason, to the archives of Venice. An idea may be formed of their importance when it is stated that they are the records of 2,276 public offices, administrations, brotherhoods, convents, and other corporations both lay and ecclesiastical. They occupy not less than 278 rooms, in the ancient Franciscan convent, known by the name of Frari. The Abbe Cadorin, who has prepared a catalogue of them, estimates that there are twelve millions of files of papers there; and this figure will not seem incredible if it be mentioned that the shelves on which these documents are piled up in double row are more than 4,525 metres in length. Besides this enormous collection, the library of St. Mark, the nucleus of which is composed of the books bequeathed by Petrarch to the patron saint of Venice, contains a great number of political papers, and the Correr, or municipal museum, boasts of possessing documents that have for a long time disappeared from the official archives. It is not only the records connected with Venetian and Italian history that render these archives so precious. They contain numerous documents relating to the history of European nations and of celebrated men from the 13th to the 19th century. They abound, above all, in secret correspondence, extremely interesting.

Correspondence.

ADULTERATION.—SIR,—In the *Society of Arts Journal* last week you call attention to the fact that at our recent meetings in this town the Pharmaceutical Society exhibited various articles of commerce sold with a considerable adulteration. If I had seen this exhibition, one of the articles in which I am a good deal interested would have received an explanation from me which I propose to ask you to insert in your *Journal.* The article to which I allude is cavendish tobacco, which is mentioned as being largely adulterated with liquorice. A brother of mine in Natal, with whom I am associated in business, is a large tobacco grower in addition to his other growths of cotton and coffee. He finds a ready sale for tobacco manufactured in the shape of cake or plug cavendish in the colony, selling it there at about 1s. per lb. wholesale. But in its manufacture he had to use about ten per cent. of Spanish liquorice, and for this he had to pay 2s. 3d. per lb., entailing a very considerable addition to the expense of manufacture, instead of reducing the price as your notice would suggest. If he had imported this manufactured article it would all have paid the 5s. duty which is imposed by the customs on cigars and all tobacco, except the dried leaf, which pays 3s. 2¼d. per lb., the duty of course being paid on the gross weight of the cavendish, and it is thus rendered a legitimately prepared, duty paid, commercial import. The fact of sailors having it for their own consumption shows that the cavendish thus prepared is liked better than a purer article, inasmuch as in the colony of Natal we willingly sell the tobacco at 9d. per lb. unmanufactured, while the cavendish would not be sold probably at much less than 2s. per lb. in retail quantities. I may just add that I have been sending out, through Messrs. Travers and Sons, "Baracco" juice, which will not be landed in Natal at less than 11d. per lb., to use with the leaf that we should gladly sell at 9d., or less.—I am, &c., J. MANNING.

A REMEDY PROPOSED FOR THE SMOKE NUISANCE.—SIR,—Whilst looking at some gas works, many years since, at Birmingham, viz., in 1836, I was astonished at finding the thickened coal gas become diaphanous, and entirely purified of its pyrites and other dense colours, by being made to pass through a thin stratum of dried lime, which was laid upon a wire sieve; and I am tolerably certain that the smoke-gas was only passed once through the sieve in order to effect its purification, when it became fit for combustion. This being the case, the question now arises whether the coal smoke of every chimney cannot be purified in a similar manner, viz., by making the smoke pass, along with the draught of air of the furnace or fire-place, through a thin stratum of dry lime laid upon a sieve placed in the chimney of the same, such sieve to be removed temporarily as occasion might require. Should this remedy be found effectual, the grand difficulty of the present day—the smoke nuisance—will have been overcome, and at what a trivial cost for so great a benefit, for it would confer upon this vast metropolis—on all the world, in fact—a pure atmosphere and an unimpeded view of the azure vault of Heaven, and light and life and health to its myriads of occupants, and no longer to call for the, as yet, applicable but beautiful lines of Thomson:—

> "Ye who would from London smoke and turmoil fly,
> To seek a purer air and brighter sky."

Or otherwise, would it not suffice to pass the smoke through a simple sieve alone? although it is probable the deposit in the latter case would be much greater than in the former, because the lime would, especially when heated, destroy or absorb a great quantity, if not all, of the deposit, and render the volume of smoke as pure as purified gas, as it passes through the interstices of the sieve. Should the collection of soot upon the retina or surface of the sieve become considerable, yet, as it would be found chiefly on the under side, it would perhaps suffice in this case to shake or strike the sieve, so as to cause the deposit to fall down at intervals into the fire or furnace beneath, where it would be consumed along with the fresh coal. All the soot which at present adheres to the sides of the chimney, or passes out at the top, to infect the vital atmosphere, would be thus intercepted, and made to return to the grate by an occasional rotatory movement of the sieve upon its axle of support, or be removed by some other means when required.—I am, &c., J. S. BURT, F.R.S.

Wilton-place, N.W., Oct. 20, 1866.

MEETINGS FOR THE ENSUING WEEK.

MON ...R. Geographical, 8½. Sir Henry C. Rawlinson, M.P., "On Mr. W. H. Johnson's recent journey to Khoten, in Chinese Tartary."

TUES ...Civil Engineers, 8. 1. Mr. W. B. Clegram, "Results of the employment of steam power in towing vessels on the Gloucester and Berkeley canal." 2. Mr. Samuel Healey, "On the employment of steam power on the Grand Canal, Ireland."

WED ...Microscopical, 8.

THURS...Linnæan, 8. 1. Col. Munro, "On *Bambuseæ.*" 2. Rev. M. J. Berkeley, "On some Mexican Fungi." 3. Mr. T. Edward, "On the habits of some of the smaller Crustaceans."

Chemical, 8. 1. Dr. Daubeny, "On Ozone." 2. Mr. W. N. Hartley, "On a chloro-sulphide of carbon."

Syro-Egyptian, 7½. Dr. Samuel Birch, "On the Bilingual Tablet of Tanis."

Patents.

From Commissioners of Patents' Journal, November 2nd.

GRANTS OF PROVISIONAL PROTECTION.

Agricultural produce, stacking—2505—M. Ridley, W. Pawson, and C. Basker.
Alcoholic spirits, distilling—2681—J. Slessor.
Bales, fastening—2535—M. P. Robertson.
Baths, heating—2618—L. Wilson.
Boots, cutting out—2600—W. E. Gedge.
Breech-loading fire-arms, and cartridges for—2695—M. A. F. Mennons.
Breech-loading fire-arms, and cartridges for—2711—T. Restell.
Breech-loading fire-arms, cartridges for—2653—E. M. Boxer.
Brushes, rotating—2661—S. Holness.
Carriage wheels—2655—S. Collins.
Caustic soda—2691—A. R. F. N. Darbel.
Central fire percussion cartridges—2589—W. Clark.
Chloride of manganese, utilization of—2066—W. Clark.
Colouring matters—2669—G. T. Bousfield.
Cotton warps, sizing—2659—G. Lake, jun.
Fibrous materials, spinning—2596—J. W. Baker.
Fibrous substances, cleaning—2649—L. R. Bodmer.
Fibrous substances, spinning—2529—W. Redman.
Filtering presses—2602—E. T. Hughes.
Fire-arms, breech-loading—2622—J. Syme.
Fire escapes—2507—W. Byan and W. Egar.
Fluids, propelling—2598—H. Forbes.
Forks, steels, and knife sharpeners—2663—E. Stevens.
Friction clutches—2197—C. McFarland.
Fuel—2683—J. Hamilton.
Furnaces—2667—J. Griffiths and J. Beard.
Hackle pins, flattening—2604—C. Perry.
Hammers—2677—J. G. Tongue.
Hansom safety cabs—2701—F. Ockerby.
India rubber—2707—E. L. Simpson.
Iron and steel—2614—G. H. Benson and W. G. Valentin.
Iron and steel—2616—G. H. Benson and W. G. Valentin.
Kitchen ranges—2121—E. Stevens.
Lees—2671—A. Swan.
Medallions, producing reduced copies of—2609—C. J. Hills.
Packing pistons and stuffing boxes—2699—J. Hosken.
Parkesine—2709—A. Parkes.
Plastic work, pressing—2195—J. F. M. Pollock.
Portable baths—2635—H. Jones.
Reaping and mowing machines—2689—W. Manwaring.
Scouring stones—2464—J. Duckett.
Sewage, utilizing—2606—G. W. Shinner.
Sewing machines—1880—W. Clark.
Sewing machines—2610—G. F. Bradbury.
Shafts and axles, bearings for—2697—W. and W. T. Eades.
Ships—2608—W. Dudgeon.
Ships—2657—W. L. Wrey.
Steam boilers—2673—A. V. Newton.
Steel, casting—2612—G. H. Benson and W. G. Valentin.
Substances, distilling—2685—A. V. Newton.
Threads, &c., treating—2624—W. Pidding.
Translucent surfaces—2665—P. H. Newman.
Trenails—2651—T. Greenwood.
Weaving, looms for—2620—J. Bullough.

INVENTIONS WITH COMPLETE SPECIFICATIONS FILED.

Boots and shoes—2811—L. Daggett.
Galvanized iron—2810—G. T. Bousfield.
Gases—2759—G. T. Bousfield.

From Commissioners of Patents' Journal, November 6th.

PATENTS SEALED.

1283. C. E. Brooman.
1291. H. K. York.
1305. C. Moseley.
1313. J. Becker.
1320. J. L. Norton and A. Giles.
1334. D. C. Dallas.
1340. R. Holliday.
1345. W. Botwood.
1358. B. Nicoll.
1362. W., J., and H. Harrison.
1367. C. Pryse and R. Redman.
1402. J. Beale.
1427. J. Tombs.
1574. W. E. Newton.
1674. A. V. Newton.
2230. J. Davis.
2242. W. E. Newton.
1299. E. Fidler.
1308. W. Ireland.
1310. W. E. Gedge.
1312. F. Wise.
1314. G. Snowball.
1316. W. McHuraith.
1322. J. H. Ritchie, jun.
1329. J. Sheldon.
1330. S. Middleton.
1346. J. Bernard.
1350. W. Prosser.
1351. W. Austin.
1376. J. H. Johnson.
1395. W. Clark.
1431. J. M. Dunlop.
1450. J. Longbottom and J. Eastwood.
1464. J. Purdey.
1526. W. E. Newton.
1755. C. D. Abel.
1737. S. Holmes.
1844. T. W. Rammell.
2223. T. Whitby.

PATENTS ON WHICH THE STAMP DUTY OF £50 HAS BEEN PAID.

2695. J. Brigham & R. Bickerton.
2680. F. N. Gisborne.
2681. J. Nash.
2690. B. Russ.
2722. J. Livesey and J. Edwards.
2749. F. E. Sickels.
2945. J. Smith.
3131. E. Solvay.
2717. R. Eaton.
2718. S. Bateman.
2720. J. J. Révy.
2744. H. Bessemer.
2746. H. Bessemer.
2892. E. C. Nicholson.
2814. J., J., and J. Booth.